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(54) **EMERGENCY RESPONSE VEHICLE DETECTION FOR AUTONOMOUS DRIVING APPLICATIONS**

(71) Applicant: **NVIDIA Corporation**, Santa Clara, CA (US)

(72) Inventors: **Ambrish Dantrey**, Pune (IN); **Atousa Torabi**, Santa Clara, CA (US); **Anshul Jain**, San Jose, CA (US); **Ram Ganapathi**, San Jose, CA (US); **Abhijit Patait**, Pune (IN); **Revanth Reddy Nalla**, Pune (IN); **Niranjan Avadhanam**, Saratoga, CA (US)

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(57) **ABSTRACT**

In various examples, audio alerts of emergency response vehicles may be detected and classified using audio captured by microphones of an autonomous or semi-autonomous machine in order to identify travel directions, locations, and/or types of emergency response vehicles in the environment. For example, a plurality of microphone arrays may be disposed on an autonomous or semi-autonomous machine and used to generate audio signals corresponding to sounds in the environment. These audio signals may be processed to determine a location and/or direction of travel of an emergency response vehicle (e.g., using triangulation). Additionally, to identify siren types—and thus emergency response vehicle types corresponding thereto—the audio signals may be used to generate representations of a frequency spectrum that may be processed using a deep neural network (DNN) that outputs probabilities of alert types being represented by the audio data. The locations, direction of travel, and/or siren type may allow an ego-vehicle or ego-machine to identify an emergency response vehicle and to make planning and/or control decisions in response.